

AMENDMENTS TO THE CLAIMS

1-11. (Cancelled)

12. (Currently Amended) An optical fiber coupling part comprising:

an optical fiber; and

at least one GRIN lens fusion-spliced with an end of said optical fiber, said GRIN lens having an exposed end, and said GRIN lens having a numerical aperture NA that is larger than a numerical aperture NA_s of a light emitting source, wherein the numerical aperture NA is 0.43 or more, and wherein a tip part of said exposed end of said GRIN lens is flat.

13. (Previously Presented) The optical fiber coupling part according to claim 12, wherein the GRIN lens has a coefficient of thermal expansion expressed by $15 \times 10^{-7} \text{K}^{-1}$ or less, and is formed by a sol-gel method.

14-16. (Cancelled)

17. (Currently Amended) An optical fiber coupling part comprising:

an optical fiber having a numerical aperture NA_f;

a first GRIN lens having a numerical aperture NA₁, said first GRIN lens having an exposed end; and

a second GRIN lens having a numerical aperture NA₂, wherein a first end of said second GRIN lens is fusion spliced with an end of said optical fiber and a second end of said second GRIN lens is fusion spliced with said first GRIN lens,

wherein a tip part of said exposed end of said first GRIN lens is flat, and wherein the numerical aperture NA_f of the optical fiber, the numerical aperture NA₁ of the first GRIN lens, the numerical aperture NA₂ of the second GRIN lens, and a numerical aperture NA_s of a light emitting source are selected to satisfy the formula expressed by:

$$\text{NA}_f \leq \text{NA}_2 < \text{NA}_s \leq \text{NA}_1.$$

18. (Previously Presented) The optical fiber coupling part according to claim 17, wherein the numerical aperture NA_1 of said first GRIN is 0.43 or more.

19. (Previously Presented) The optical fiber coupling part according to claim 17, wherein a length Z_1 of the first GRIN lens satisfies the formula expressed by:

$$Z_1 = (n_0 * d_1 / NA_1) \arctan (d_1 / (NA_1 * L))$$

wherein a refractive index of glass at a center part of the first GRIN lens is set at n_0 , a radius of the first GRIN lens is set at d_1 , and a distance between the lens and the light emitting source is set at L .

20. (Previously Presented) The optical fiber coupling part according to claim 17, wherein said first GRIN lens and said second GRIN lens have a coefficient of thermal expansion expressed by $15 \times 10^{-7} K^{-1}$ or less, and at least the first GRIN lens is made by a sol-gel method.

21-29. (Cancelled)